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Rev. 07/10/02

17001a

CH2M HILL
SITE SAFETY PLAN

I. GENERAL INFORMATION

CLIENT: U.S. EPA JOB NOS: W63582.QS W64641.QS
PROJECT MANAGER: Al Sloan/GLO
SITE NAME: Northside Sanitary Landfill (NSL)/Environmental Conservation and Chemical Corporation (ECC)
SITE LOCATION: Boone County, Indiana, 10 miles northwest of Indianapolis
PURPOSE OF FIELD VISIT(S): Sample leachate collection tanks and groundwater from five existing monitoring wells. Leachate collection tanks will be emptied as is currently done for disposal, daily infiltration volume will be measured by water level measurements and tank depth. A submersible pump will be used to recirculate the tank contents and sample the contents.
DATE OF VISIT(S): August 24 through 28, 1987
BACKGROUND INFORMATION: Complete X Preliminary _____
INFORMATION AVAILABLE FROM: GLO (office)
OVERALL HAZARD SUMMARY: Serious _____ Moderate _____
Low X Unknown _____

II. SITE CHARACTERISTICS

Facility Description (site map attached)

Northside Sanitary Landfill (NSL) is an active operating solid waste disposal facility. The site occupies 70 acres of a 168-acre tract and is currently being filled to above grade elevations. Environmental Conservation and Chemical Corporation (ECC) is a former solvent processing and reclaiming faciling partially owned by the owner of NSL and is immediately west of the landfill. The two sites were investigated together.

Principal Disposal Method (type and location)

Fill and cover of industrial, municipal, and hazardous waste. The landfill is presently only licensed to accept municipal waste.

Features and Unusual Features (power lines, gas lines, water mains, terrain, etc.)

The site is partially located in the 100-year flood plain of Finley Creek and an unnamed ditch flows between NSL and ECC. There are no power lines, gas lines, or water mains onsite.

Status (active, inactive, or unknown)

NSL is an active solid waste landfill. The ECC site is inactive since the surface cleanup and awaiting final remediation.

History (worker or non-worker injury; complaints from public; previous agency action)

A completed RI/FS has been done at this site. Refer to these documents for a detailed discussion of site history.

III. WASTE CHARACTERISTICS

Waste Type(s)

Liquid X Solid_____ Sludge_____ Gas_____

Characteristic(s)

Corrosive_____ Ignitable_____ Radioactive_____

Volatile X Toxic X Reactive_____ Carcinogenic X

IV. HAZARD EVALUATION

Overall Hazard Level

The overall hazard level for these activities is low to moderate. The potential for release of volatiles during bailing of wells and pumping of tanks exists.

Chemical Hazards

Contaminants found in groundwaters include 1,1-dichloroethene (50 ug/l), trichloroethene (1,100 ug/l), tetrachloroethene (31 ug/l), xylene (1,100 ug/l), toluene (500 ug/l), benzene (500 ug/l), naphthalene (100 ug/l), and vinyl chloride (100 ug/l) with other volatiles in lesser concentrations. Inorganic contaminants include lead, mercury, and nickel. Cyanide was detected in a well at a concentration of 60 ug/l.

Contaminants found in the leachate tanks include trans-1,2-dichloroethene (1,300 ug/l), vinyl chloride (100 ug/l), benzene (100 ug/l), 1,1-dichloroethane (460 ug/l), phenol (370 ug/l), and toluene and ethylbenzene at lower concentrations. The highest concentrations were found in Tank 2.

Hazards related to chemical exposure result from inhalation of volatiles, ingestion of contaminated materials, and dermal contact with contaminated water. Most of the compounds that are known to occur in the leachate tanks and groundwater are not dermally active. Mercury, however, is readily absorbed through the skin. See Table 1 for chemical hazards.

Refer to the endangerment assessment prepared for the RI/FS for additional toxicity profiles on the compounds present onsite. Some compounds onsite are known human carcinogens. Symptoms of exposure to the volatiles are all very similar, with headache, nausea, mucous membrane irritation, and irritability.

Table 1
THRESHOLD LIMIT VALUES, VAPOR PRESSURES AND
TOXICITY PROFILES OF DETECTED COMPOUNDS

Compound	Threshold Limit Value[1] (ppm)	Vapor Pressure[2] (mm Hg)	Toxicity Profile
1,1-Dichloroethene	200	1.82 E 02	Liver and kidney carcinogen.
Trichloroethene	50	5.79 E 01	Liver and kidney carcinogen.
Tetrachloroethene	50	1.78 E 01	Liver and kidney carcinogen.
Xylene	100	1.00 E 01	Eye irritant, inhibits immune response, chronic liver toxin.
Toluene	100	2.81 E 01	Nausea, headache, dizziness. Eye irritant. Central nervous system toxin.
Benzene	10	9.52 E 01	Acute central nervous system toxin. Leukemogen.
Naphthalene	10	1.00 E 01 (53°C)	Nausea, headache, profuse perspiration. Skin and eye irritant.
Vinyl Chloride	5	2.66 E 03	Headache, dizziness, abdominal pain and numbness of extremities. Brain, lung, and liver carcinogen. Mutagen.
Lead	0.15 mg/m^3	0.00 E 00	Anemia. Central nervous systems toxin. Kidney toxin. Kidney carcinogen.
Mercury	0.1 mg/m^3	2.00 E-03 (inorganic compounds)	Central nervous system toxin.
Cyanide	5 mg/m^3	6.20 E 02 (hydrogen cyanide)	Causes headaches, weakness, taste and smell changes, throat irritation and nausea. Levels over 100 mg/m^3 may be fatal within 1 hour.

[1] ACGIH, Threshold Limit Values for Chemical Substances in the Work Environment, 1986.

[2] As cited by U.S. EPA, Superfund Public Health Evaluation Manual, EPA, 540/1-86/060, October 1986. Value for naphthalene from Verschueren, K., Handbook of Environmental Data on Organic Chemicals, Second Edition, Van Nostrand Reinhold Company, 1983.

Physical Hazards

Physical hazards would be limited to those associated with active operations at the landfill and heat stress. Landfill traffic is often heavy and quick moving. All operations on the active landfill require extra caution due to vehicular traffic.

Hazards Posed by Chemical Substances Provided by CH2M HILL: In accordance with Indiana regulations for hazard communication, Material Safety Data Sheets (MSDS) are provided for the following chemical:

- o Explosimeter calibration gas
- o NHu calibration gas
- o Compressed air
- o MSA respirator cleanser-sanitizer
- o Methanol
- o Glacial Acetic Acid
- o Sodium Acetate
- o Cadmium Carbonate
- o Lead Acetate Paper
- o Nitric Acid
- o Sodium Hydroxide

V. PROCEDURES

SITE ORGANIZATION

Map/Sketch Attached Yes Site Secured Yes

Perimeter Identified Yes

Zone(s) of Contamination Identified Yes

SITE PERSONNEL

Team Organization

Team Member	Responsibility
Al Sloan/CH2M HILL	Site Manager and Sampling Team Member
Hubert Wieland or Dick Gibbs/B&V	Level B Site Safety Coordinator
Jeff Keiser/CH2M HILL	Sampling Team Leader
Jerry Bills/CH2M HILL**	Analytical Technician and Sampling Team Member
Denise Storey/PRC	Sampling Team Member
Ray Mastrolonardo/PRC	Sampling Team Member

Each of the team members named above meets the training and medical surveillance requirements of 29 CFR 1910.120. In addition, each is currently certified by the American Red Cross, or equivalent, in both first aid and CPR.

**Medical certification expired. Restricted from field work until further notice.

Note: The SCC is to complete Form 533 (attached) and return it to M.A. Chillingworth/WDC at the end of each week.

LEVEL OF PROTECTION

A _____ B __X__ C _____ D __X__

Level D: Steel toe, steel shank neoprene boots, layered washable clothing, Tyvek coveralls, neoprene gloves with surgical inner gloves. Tape boots and gloves to coveralls when sampling from the tanks and bailing wells for sampling. Hard hat and safety glasses. Wear PVC or Saranex coveralls if splash potential exists. Add a face shield, as well.

Level B: Tyvek coveralls, Nitrile outer gloves, MSA pressure-demand supplied air respirator (air line or SCBA).

SAFETY EQUIPMENT AND MATERIALS

First aid kit, eye wash, stretcher or blanket, clean water, paper cups, wind direction indicator, outdoor thermometer, and 20 lb ABC fire extinguisher. CH2M HILL personnel to wear TLD badge.

MONITORING EQUIPMENT AND PROCEDURES

Carefully inspect each piece of monitoring equipment prior to work startup. Failure of any of the equipment listed below to work properly must be reported to the Site Manager immediately.

Explosimeter/O_2 Meter: Calibrate prior to each day's activities, according to manufacturer's instructions. Recharge at the end of each day. Monitor around the tank and well head and record measured levels in the log book at every new location.

Action Levels: Greater than 50 percent LEL leave the area and do not return until ventilation can be supplied.

Rad-mini: Check background and check response with a Coleman lantern mantle. Monitor during initial entry and record measured levels in the log book every 30 minutes.

Action Levels:

Background: continue investigation
Above background: Define perimeter, remain outside this perimeter and call EPA client. Do not enter areas with above background readings.

HNu (with 10.2 eV lamp): Calibrate prior to each day's activities, according to manufacturer's instructions. Record calibration in the log book. Recalibrate after cleaning the lamp or when background levels

drift. This instrument is sensitive to humidity and may require periodic lamp cleaning if it is humid. Monitor continuously during bailing, pumping and sampling in the breathing zone and record measured levels in the log book every time a new well is opened and every 30 minutes thereafter.

Action Levels: Concentrations greater than 0.5 above background in the breathing zone require an upgrade to Level B due to the potential presence of vinyl chloride in the groundwater and tanks.

REMEMBER: The HNu is affected by methane, although it does not "see" methane. High concentrations of methane will affect the unit potential creating false (lower) contaminant concentrations.

Monitox HCN Meter: Must be used when bailing, pumping, and sampling. If concentrations reach 5 ppm, leave the site immediately and return in Level B. Level B must be used for HCN. Remember, HCN does not necessarily have to be in the breathing zone to do damage to the body because it is dermally absorbed. Wash hands frequently if in contact with HCN contaminated waters or soils. Above 40 ppm, evacuate.

SITE ENTRY PROCEDURES

- Locate nearest available telephone.
- If sampling the tanks requires onsite entry, inform the operators of your presence onsite and scheduled activities. Arrange an emergency notification signal.
- Confirm and post emergency telephone numbers and route to hospital.
- Designate at least one vehicle for emergency use.
- Determine wind direction, establish hotline and, set up decontamination facilities.
- If toilet facilities are not located within a 3 minute walk from the decontamination facilities, either provide a chemical toilet and hand washing facility or have a vehicle available (not the emergency vehicle) for transport to nearby facilities.

WORK LIMITATIONS (Time of day, etc.)

- No eating, drinking, or smoking onsite
- No contact lenses to be worn onsite
- No facial hair that would interfere with respirator fit
- Buddy system at all times in exclusion zone
- CH2M HILL employees to wear TLD badge at all times when on or near the site

DECONTAMINATION PROCEDURES

Personnel: Wash boots and outer gloves in TSP and water, rinse in water, and remove outer gloves. If Tyveks are dirty, wash while washing boots. Remove backpack harness if Level B is worn, leaving facepiece on. Remove Tyveks. Remove facepiece. Remove inner gloves and wash hands and face. Shower and wash hair nightly.

Sampling equipment: As outlined in the sampling plan dated July 21, 1987.

Samples: As outlined in the sampling plan dated July 21, 1987. All sample jars are to be deconned prior to packaging for shipping to CLP.

Heavy Equipment: None required.

Please Note: It is the responsibility of the Site Safety Coordinator to make sure that all pieces of equipment coming offsite are properly decontaminated according to the procedures outlined above.

Documentation of decontamination must be made in the field log notebook that will then become part of the permanent project file. A suitable tag is to be placed on each piece of decontaminated CH2M HILL equipment (or group of equipment, such as a bag of hand tools), stating the date of decontamination and initiated by the SSC.

DISPOSAL OF MATERIALS GENERATED ON SITE

All materials with HNu readings above background will be drummed. Otherwise, purge water from wells is to be spilled onsite. All health and safety disposables are to be drummed.

VI. CONTINGENCY PLAN

If an injury occurs, take the following steps:

- Prevent further injury and notify SSC and STL.
- Initiate first aid and get medical attention for the injured immediately.
- Depending upon the type and severity of the injury, call the medical consultant and/or occupational physician.
- Notify the Health and Safety Manager.
- Notify the injured person's personnel office.
- Prepare an incident report. The SSC is responsible for its completion and submittal to the Health and Safety Director and CH2M HILL corporate personnel office within 48 hours.
- The SSC will assume charge during a medical emergency.

In the event of fire, explosion, or chemical release, evacuate team members to a safe upwind position and call Fire Department, (317) 873-3344 then call the owner (John Bankert, Sr.) at (317) 769-4223. The SSC will assume command until relieved by the Fire Department.

LOCAL (CH2M HILL Form 311, Emergency Information, will be posted onsite)

Ambulance: Zionsville Emergency Ambulance--(317) 873-3364

Hospital: Whitman Memorial Hospital
1124 N. Lebanon Street
Lebanon, IN
(317) 482-2700

Poison Control Center: Whitman Memorial Hospital
(317) 482-2700, ext. 241

Sheriff/Police: Boone County Sheriff--(317) 482-1412

Fire: Zionsville Fire Department--(317) 873-3344

Airport: Boone County Airport
Zionsville
(317) 873-4522

Explosives Unit: Boone County Sheriff--(317) 482-1412

Onsite Telephone: (317) 372-3223

EMERGENCY ROUTES (map attached to plan)

U.S. Route 421, north to State Route 32. West on 32 to South Lebanon Street in Lebanon. North on Lebanon Street to Essex Street Whitman Hospital on left side.

EMERGENCY CONTACTS

o CH2M HILL Medical Consultant

Name: Dr. Kenneth Chase, Washington Occupational Health Associates, Inc.
Phone: 202/463-6698 (8-5 EST)
202/463-6440 (after hours answering service; physician will return call within 30 minutes)

o CH2M HILL Health and Safety Manager

Name: Mary Anne Chillingworth/WDC
Phone: 703/471-1441 (O)
703/476-0882 (H)

o Occupational Physician/CH2M HILL

Name: Milwaukee Industrial Clinic
Phone: (414) 931-7600
Address: 500 North 19th Street
Milwaukee, WI 53233

Team members under his care:

Al Sloan, Jeff Keiser, Jerry Bills

o Occupational Physician/B&V

Name: Dr. Egene Welter
Phone: (913)894-6600
Address: Business and Industry Health Group
10640 West 87th Street
Overland Park, KS 66214

Team members under his care:

Hubert Wieland, Dick Gibbs

o Occupational Physician/PRC

Name: Carnow, Conibar and Associates Ltd.
Phone: (312)782-4486
Address: 333 Wacker Drive
Chicago, IL 60604
Team Members under his care: Denise Storey, Ray Mastrolonardo

o CH2M HILL Site Manager

Name: Al Sloan/GLO
Phone: (414) 272-2426 (O)
(414) 549-5664 (H)

o Client Contact

Name: Karen Vendl/EPA Region V
Phone: (312) 886-4739 (O)

o CH2M HILL Regional Manager

Name: Mike Jury/GLO
Phone: (414) 272-2426 (O)

o Personnel Office/CH2M HILL

Name: Marty Oldham/GLO
Phone: (414) 272-2426 (O)

- Personnel Office/B&V

Name: Dr. George A. Carson
Phone: (913)661-6494 (O)

- Personnel Office/PRC

Name: Dan Chow
Phone: (312) 856-8700 (O)

If an injury occurs, notify the injured person's personnel office as soon as possible after obtaining medical attention for the injured. Notification MUST be made within 24 hours of the injury.

- CH2M HILL Director of Health and Safety

Name: John Hochstrasser/NJO
Phone: 201/337-9200
Address: CH2M HILL
169 Ramapo Valley Road
Oakland, NJ 07436

- CH2M HILL Corporate Personnel Office

Name: Sharon Robinson/CVO
Phone: 503/752-4271
Address: CH2M HILL
2300 N.W. Walnut Blvd.
Corvallis, OR 97330

VII. PLAN APPROVAL

This site safety plan has been written for the use of CH2M HILL, its employees and subcontractors. CH2M HILL claims no responsibility for its use by others. The plan is written for the specific site conditions, purposes, dates and personnel specified and must be amended if these conditions change.

PLAN PREPARED BY: Donna LaBar/DEN Date: 6/24/87

PLAN REVISED BY: Alpheus Sloan/GLO Date: 7/24/87

PLAN APPROVED BY: Mary Anne Chillingworth Date: 7/30/87

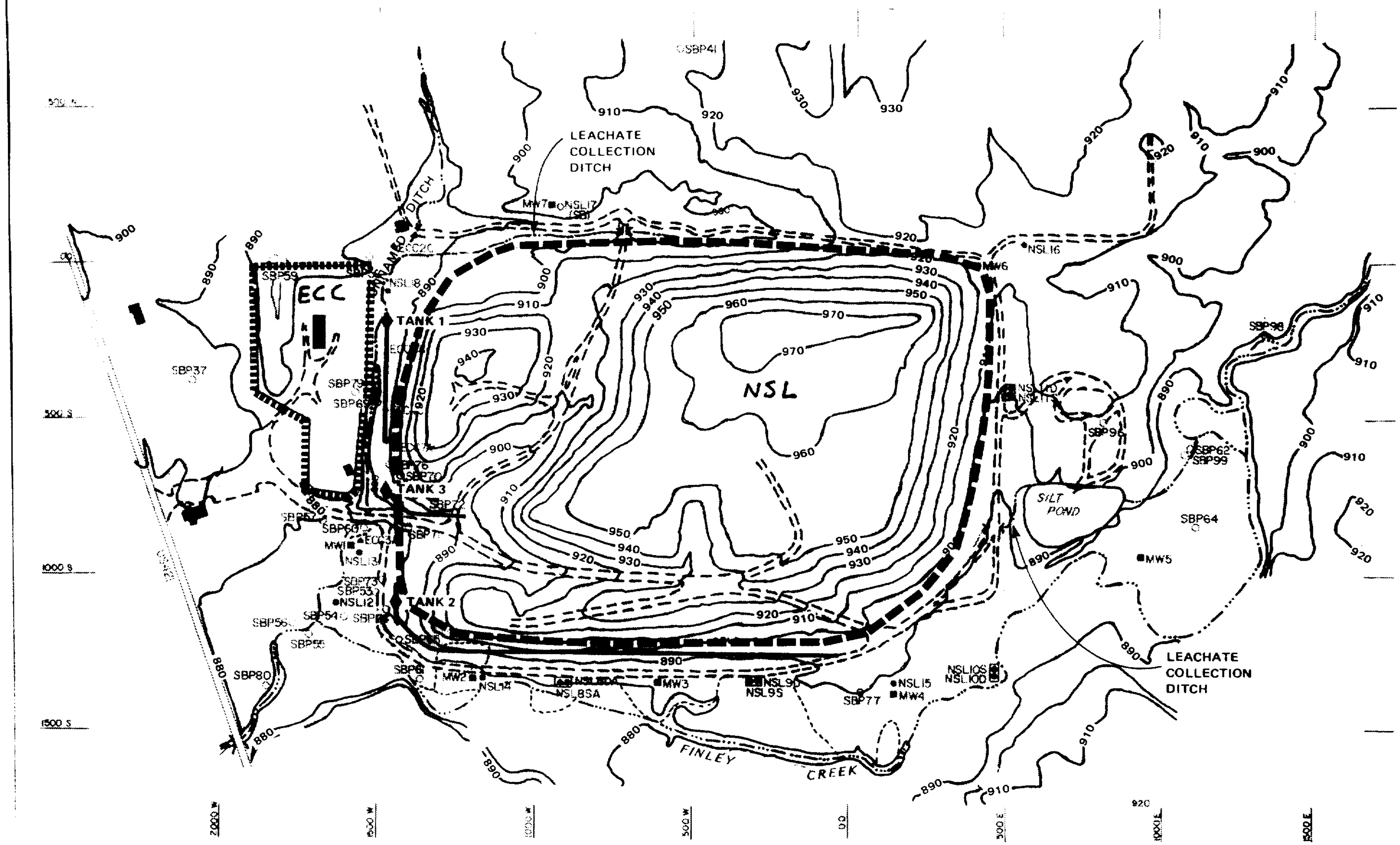
Attachments:

- Site Map
- Form 311, Emergency Phone Numbers
- Form 533, Record of Hazardous Waste Field Activity
- MSDS for Esposimeter calibration gas, HNu calibration gas, compressed air, MSA respirator, cleanser-sanitizer, methanol

Distribution of Approved Plan:

- Site manager (responsible for distribution to team members and client)
- Health and Safety Manager

WDR260/026
GLCOM2/10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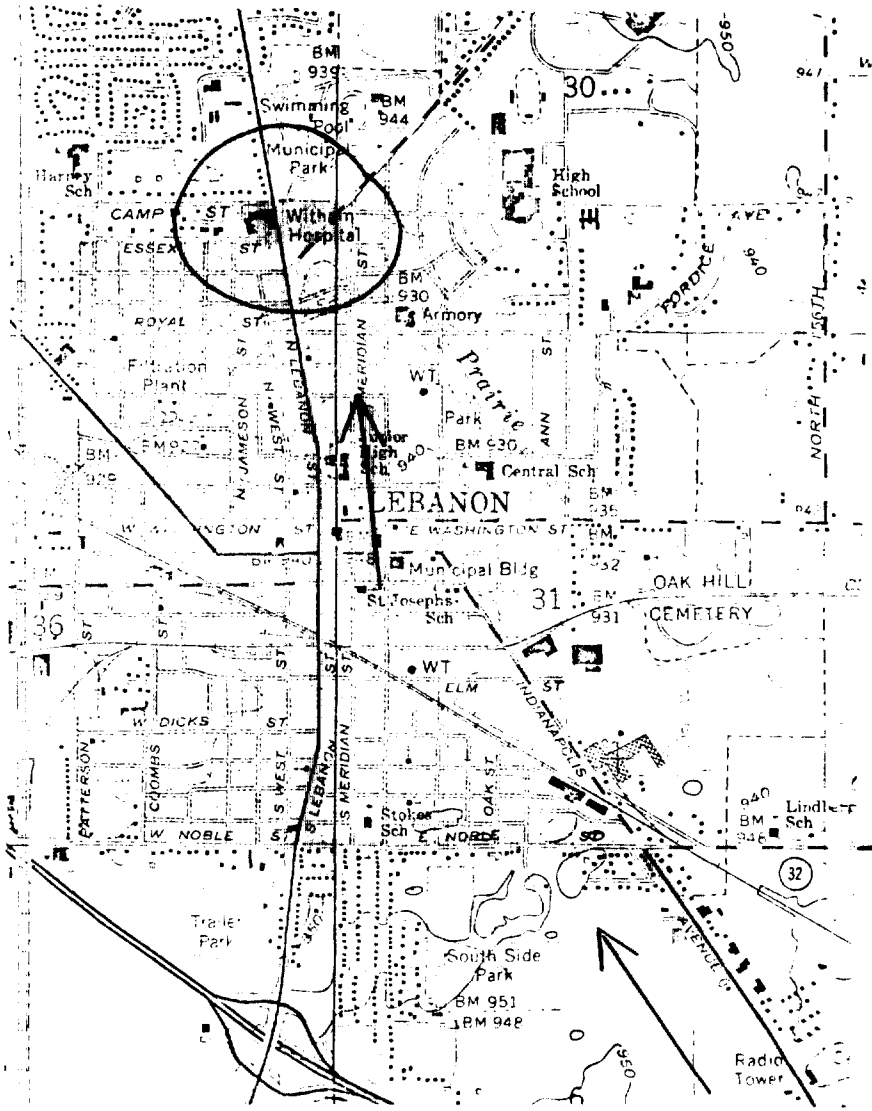
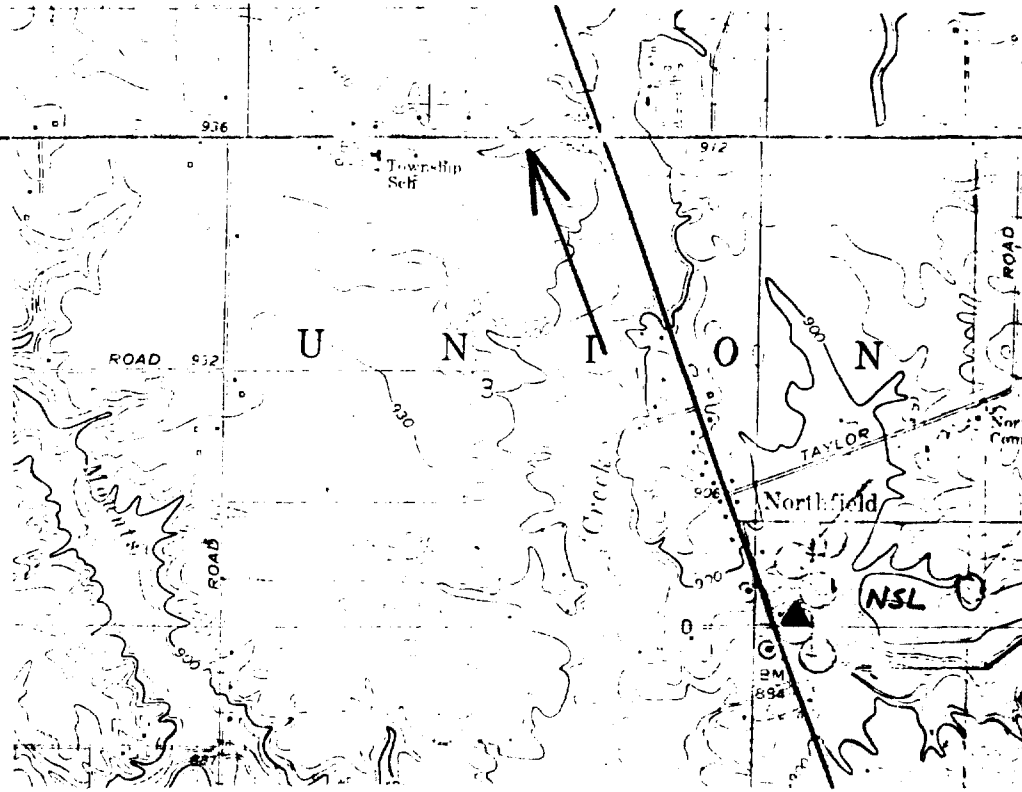
Site Map





HOSPITAL ROUTE

NORTHSIDE SANITARY LANDFILL

NORTHFIELD, INDIANA

FORM 533

RECORD OF HAZARDOUS WASTE FIELD ACTIVITY

SITE NAME: Northside Sanitary Landfill (NSL)/Environmental Conservation and Chemical Corporation (ECC)
SITE SAFETY COORDINATOR: Hubert Wieland or Dick Gibbs
PROJECT NUMBER: W63582.FT/W64641.FT
RECORD OF ACTIVITIES FOR (DATES): 8/24/87 through 8/28/87

	Employee Name	Total Days Onsite	Days at the Site in Level B	Level C	Level D	or	Number of days as SSC Level B	Level C	Level D	Activities Employees Performed While Onsite
1.										
2.										
3.										
4.										
5.										
6.										
7.										
8.										
9.										
10.										

Signature of SSC: _____

GLT718/19

EMERGENCY PHONE NUMBERS

	phone	address	contact
POLICE DEPARTMENT	(317) 482-1412	Boone County	
			attn:
FIRE DEPARTMENT	(317) 873-3344	Zionsville	
			attn:
PARAMEDIC	(317) 873-3364	Zionsville	
			attn:
FIRE REPORT	(317) 873-3344	Zionsville	
			attn:
AMBULANCE SERVICE	(317) 873-3364	Zionsville	
			attn:
WATER DEPARTMENT			
			attn:
GAS UTILITY			
			attn:
ELECTRIC UTILITY			
			attn:
TELEPHONE UTILITY			
			attn:
LOCAL SANITARIAN			
			attn:
HOSPITAL	(317) 482-2700	Lebanon	
			attn:
OWNER	(317) 769-4223		
			attn: John Banker T. Sr.
			attn:
			attn:
			attn:
			attn:

this notice is located at: NSL/ECC Site

GL1718/19

"ATERIAL SAFETY DATA SHEET
CFR 1910.1200 OSHA Hazard
Communication Rule Format

MINE SAFETY APPLIANCES COMPANY
600 Penn Center Boulevard
Pittsburgh, PA 15235
PHONE (412) 273-5000

PRODUCT IDENTITY

LABEL IDENTITY - MSA P/N 459945 Calibration Check Gas, 2% Methane in Air

CHEMICAL NAME - Methane, Oxygen, Nitrogen

ADDITIONAL IDENTITIES - MSA P/N 459945 Calibration Gas

ORMULA - CH_4 in Air

APPLICABLE CHEMICAL CONTENTS

	%	TLV
Methane (CAS 74-82-8)	2.0	None*
Air	Balance	None

htane is a simple asphyxiant (ACGIH 1984-85)

NOTE: Gas Under Pressure, 250 PSIG at 70°F
Approx. 16 Liters at Atmospheric Pressure

PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR - Colorless, Odorless Gas
BOILING POINT - N/A
SPECIFIC GRAVITY (H_2O = 1) - N/A
VAPOR PRESSURE - N/A
PERCENT VOLATILE BY VOLUME - N/A
VAPOR DENSITY (AIR = 1) - <1
SOLUBILITY IN WATER - Methane -- 9 cm^3/100 ml (20°C)
Oxygen -- 3.2 cm^3/100 ml (25°C)
Nitrogen -- 2.3 cm^3/100 ml (0°C)

PHYSICAL HAZARD INFORMATION

PHYSICAL HAZARD - Compressed Gas 250 PSIG at 70°F

CONDITIONS OR MATERIALS TO AVOID - None

FLASH POINT - N/A (Methane) LEL (5.3%) UEL (14.0%)

EXTINGUISHING MEDIA - This Calibration Gas Mixture is Not Flammable

SPECIAL FIRE FIGHTING PROCEDURES - See Next Item

UNUSUAL FIRE AND EXPLOSION HAZARDS - Gas Under Pressure, 250 PSIG at 70°F. Do Not Exceed 120°F.

HEALTH HAZARDS

HEALTH HAZARDS - Methane is a simple asphyxiant (ACGIH 1984-85)

SIGNS AND SYMPTOMS OF EXPOSURE - None Known For 2% Methane

PRIMARY ROUTES OF ENTRY - Inhalation

TARGET ORGANS - Lungs

MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE - No Information

EXPOSURE LIMITS - None. Methane is a Simple Asphyxiant (ACGIH 1984-85). OSHA-None

CARCINOGENICITY DATA - Not Listed in NIOSH RTECS.

EMERGENCY AND FIRST AID PROCEDURES - None

SAFE HANDLING AND USE

HYGIENIC PRACTICES - Avoid Breathing Gas

`TECTIVE MEASURES DURING REPAIR AND MAINTENANCE OF CONTAMINATED EQUIPMENT - Not Applicable

PROCEDURES FOR SPILL OR LEAK CLEANUP - Ventilate Area

WASTE DISPOSAL - Do not puncture or incinerate cylinder. Before discarding cylinder, slowly release contents to a safe exhaust.

STORAGE - Store in a cool, dry, well-ventilated area. Do not exceed 120°F.

CONTROL MEASURES

PERSONAL PROTECTIVE EQUIPMENT - Due to the limited amount of gas in the cylinder, and the low release rate employed in instrument calibration, respiratory protection is not indicated under conditions of intended use.

ENGINEERING CONTROLS - Mechanical ventilation is suitable.

WORK PRACTICES - Avoid breathing gas. Use in well-ventilated areas. Follow the calibration procedure detailed in the MSA instruction manual provided with the instru under calibration.

DATE OF PREPARATION - September 1985

The information provided herein has been compiled from sources believed to be reliable. However, Mine Safety Appliances Company makes no warranty as to the accuracy, completeness, o sufficiency of the information and in no event will Mine Safety Appliances Company be responsible for loss or damage of any nature whatsoever resulting from use of the information

IBL

ISOBUTYLENE

Common Synonyms
Isobutene
2-Methylpropene

Liquefied compressed gas Colorless Sweet gasoline-like odor

Floats and boils on water. Flammable visible vapor cloud is produced.

Stop discharge if possible. Keep people away.
Shut off ignition sources and call fire department.
Stay upwind and use water spray to "knock down" vapor.
Avoid contact with liquid.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

FLAMMABLE.
Flashback along vapor trail may occur.
Vapor may explode if ignited in an enclosed area.
Stop flow of gas if possible.
Cool exposed containers and protect men effecting shutoff with water.
Let fire burn.
Extinguish small fires with water, dry chemical, or carbon dioxide.

Exposure

CALL FOR MEDICAL AID.

VAPOR
Irritating to eyes, nose, and throat.
If inhaled, will cause dizziness, or loss of consciousness.
Move to fresh air.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

LIQUID
Will cause frostbite.
Flush affected areas with plenty of water.
DO NOT RUB AFFECTED AREAS.

Water Pollution

Not harmful to aquatic life.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG-446-4)

Issue warning - high flammability
Restrict access
Evacuate area

2. LABEL

Red

3. CHEMICAL DESIGNATIONS

3.1 Synonyms: Isobutene
2-Methylpropene

3.2 Coast Guard Compatibility Classification: Olefin

3.3 Chemical Formula: $(CH_3)_2C=CH_2$

3.4 NAERO/United Nations Numerical Designation: 2.1055

4. OBSERVABLE CHARACTERISTICS

4.1 Physical State (as shipped): Liquid under pressure

4.2 Color: Colorless

4.3 Odor: Mild sweetish

5. HEALTH HAZARDS

5.1 Personal Protective Equipment: Chemical gloves and eye protection; organic vapor canister or self-contained breathing apparatus.

5.2 Symptoms Following Exposure: Inhalation of moderate concentrations causes dizziness, drowsiness, and unconsciousness. Contact with eyes or skin may cause irritation; the liquid may cause frostbite.

5.3 Treatment for Exposure: INHALATION: remove victim to fresh air and apply resuscitation; call a physician promptly if victim is unconscious. EYES: if irritated, wash with water. SKIN: if irritated, wash with soap and water.

5.4 Toxicity by Inhalation (Threshold Limit Value): 1000 ppm (8 hr)

5.5 Short-Term Inhalation Limits: Data not available

5.6 Toxicity by Ingestion: Not pertinent

5.7 Late Toxicity: None

5.8 Vapor (Gas) Irritant Characteristics: Vapors are non-irritating to eyes and throat.

5.9 Liquid or Solid Irritant Characteristics: No appreciable hazard. Practically harmless to skin because it is very volatile and evaporates quickly. May cause frostbite.

5.10 Odor Threshold: Data not available

6. FIRE HAZARDS

6.1 Flash Point: −105°F C.C.

6.2 Flammable Limits in Air: 1.8%–9.6%

6.3 Fire Extinguishing Agents: Let fire burn, stop flow of gas. Water fog, dry chemical, or carbon dioxide may be used for small fires.

6.4 Fire Extinguishing Agents Not to be Used: Not pertinent

6.5 Special Hazards of Combustion Products: Not pertinent

6.6 Behavior in Fire: Containers may explode in fire. Vapor is heavier than air and may travel a long distance to a source of ignition and flash back.

6.7 Ignition Temperature: 869°F

6.8 Electrical Hazard: Not pertinent

6.9 Burning Rate: Data not available

7. CHEMICAL REACTIVITY

7.1 Reactivity with Water: No reaction

7.2 Reactivity with Common Materials: No reaction

7.3 Stability During Transport: Stable

7.4 Neutralizing Agents for Acids and Caustics: Not pertinent

7.5 Polymerization: Not pertinent

7.6 Inhibitor of Polymerization: Not pertinent

8. WATER POLLUTION

8.1 Aquatic Toxicity: None

8.2 Waterfowl Toxicity: None

8.3 Biological Oxygen Demand (BOD): None

8.4 Food Chain Concentration Potential: None

9. SELECTED MANUFACTURERS

1. Petro-Tex Chemical Corp.
   8600 Park Place
   Houston, Texas 77017
2. Exxon Chemical Co.
   Houston, Texas 77001

10. SHIPPING INFORMATION

10.1 Grades or Purity: Commercial; polymerization

10.2 Storage Temperature: Ambient

10.3 Inert Atmosphere: No requirement.

10.4 Venting: Safety relief

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG-446-3)

A-B-C-D-E-F-G

12. HAZARD CLASSIFICATIONS

12.1 Code of Federal Regulations: Flammable compressed gas

12.2 NAS Hazard Rating for Bulk Water Transportation: Not listed

12.3 NFPA Hazard Classification:

Category	Classification
Health Hazard (Blue)	1
Flammability (Red)	4
Reactivity (Yellow)	0

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 Physical State at 15°C and 1 atm: Gas

13.2 Molecular Weight: 56.10

13.3 Boiling Point at 1 atm: 19.6°F = −6.9°C = 266.3°K

13.4 Freezing Point: −220°F = −140.3°C = 132.9°K

13.5 Critical Temperature: 292.5°F = −144.7°C = 417.9°K

13.6 Critical Pressure: 580 psia = 39.48 atm = 3.99 MN/m²

13.7 Specific Gravity: 0.59 at 20°C (liquid)

13.8 Liquid Surface Tension: 15.8 dynes/cm = 0.0158 N/m at 20°C

13.9 Liquid-Water Interfacial Tension: (est.) 40 dynes/cm = 0.04 N/m at −10°C

13.10 Vapor (Gas) Specific Gravity: 1.9

13.11 Ratio of Specific Heats of Vapor (Gas): 1.061

13.12 Latent Heat of Vaporization: 170 Btu/lb = 94.3 cal/g = 3.95 × 10⁵ J/kg

13.13 Heat of Combustion: −19,359 Btu/lb = −10,755 cal/g = −450.29 × 10⁵ J/kg

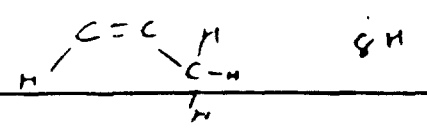
13.14 Heat of Decomposition: Not pertinent

13.15 Heat of Solution: Not pertinent

13.16 Heat of Polymerization: Not pertinent

NOTES

REVISED 1978



ISOBUTYLENE

(Synonyms: 2-Methylpropene; Isobutene)
[Formula: $CH_2:C(CH_3)_2$]

PHYSICAL CONSTANTS

Molecular Weight	56.11
Vapor Pressure @ 70°F. (Cylinder Pressure)	24.3 p.s.i.g. (1.7 kg./cm.² gauge)
Specific Volume @ 70°F., 1 atm.	6.7 cu. ft./lb. (418.2 ml./g.)
Boiling Point @ 1 atm.	19.6°F. (−6.9°C.)
Freezing Point @ 1 atm.	−220.63°F. (−140.35°C.)
Specific Gravity, Gas @ 60°F., 1 atm. (Air = 1)	1.997
Density, Liquid @ 20°C., @ Saturation Pressure	0.598 g./ml.
Critical Temperature	292.5°F. (144.7°C.)
Critical Pressure	579.2 p.s.i.a. (39.4 atm.) (40.7 kg./cm.² absolute)
Critical Density	0.234 g./ml.
Latent Heat of Vaporization @ b.p.	94.22 cal./g.
Latent Heat of Fusion @ m.p.	25.265 cal./g.
Specific Heat, Liquid @ 60°F.	0.549 cal./(g.) (°C.) or BTU/(lb.) (°F.)
Specific Heat, Gas @ 60°F., 1 atm.	
Cp	0.3701 cal./(g.) (°C.) or BTU/(lb.) (°F.)
Cv	0.3347 cal./(g.) (°C.) or BTU/(lb.) (°F.)
Specific Heat Ratio, Gas @ 60°F., 1 atm., *Cp/Cv*	1.106
Flammable Limits in Air	1.8-8.8% (by volume)
Autoignition Temperature	869°F. (465°C.)
Gross Heat of Combustion, Gas @ 60°F., 1 atm.	3156 BTU/cu. ft. (28.1 cal./cc.)
Viscosity, Gas	
@ 0°C., 1 atm.	0.0073 centipoise
@ 40°C., 1 atm.	0.00843 centipoise
Surface Tension @ 68°F.	12.27 dynes/cm.
Index of Refraction, n_D^{20}	1.3796

DESCRIPTION—Isobutylene under standard conditions is a colorless, flammable gas having an unpleasant odor similar to coal gas. It is shipped as a liquefied petroleum gas in cylinders under its own vapor pressure of approximately 24 p.s.i.g. at 70°F.

SPECIFICATIONS—Matheson Gas Products supplies two grades of isobutylene. Specifications are given below.

1. Research Grade

This grade of isobutylene is of the highest purity that is available. A typical lot purity is 99.52 mole % as determined by freezing point. Purity may vary slightly from lot to lot. This material is furnished with a statement of purity.

2. C.P. Grade

This grade of isobutylene has a minimum purity of 99 mole %. A typical analysis is as follows:

Component	Weight %
Isobutylene	99.3
Isobutane	0.1
trans-2-Butene	trace
1-Butene	0.4
Water	177 p.p.m.
Sulfur	8 p.p.m.
n-Butane	0.2

USES—Isobutylene is used in organic synthesis and in the production of high octane aviation gasoline. Its main use is in the production of Butyl rubber where it comprises 98% of the raw material used.

TOXICITY—Isobutylene is a simple asphyxiant and has an anesthetic effect which is stronger than the anesthetic action

Air Products and Chemicals, Inc.
Box 538, Allentown, PA 18105
Tel. (215) 481-4911 · TWX 510-651-3686
CABLE-AIRPROD · TELEX 84-7416

Air Products

Industrial Gas Division

Air Material Safety Data Sheet

A-2

EMERGENCY PHONE: 800—523-9374 IN PENNSYLVANIA: 800—322-9082	TRADE NAME AND SYNONYMS: Air; Compressed Air; Compressed Air, Breathing Quality	CHEMICAL NAME AND SYNONYMS: Air
ISSUE DATE AND REVISIONS: Issued: 15 March 1978 Rev: 23 February 1981	FORMULA: Reconstituted air—approx. 79% N_2, 21% O_2 Compressed—78% N_2, 21% O_2, Balance: Other atmospheric gases	CHEMICAL FAMILY: N/A

HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
Air is nontoxic and has no threshold limit value. (TLV).

SYMPTOMS IF INGESTED, CONTACTED WITH SKIN, OR VAPOR INHALED
Air is nontoxic and is necessary to support life. Inhalation of air at high pressures, such as pressures which may exist in hyperbaric chambers, can result in similar symptoms to those of exposure to oxygen. Inhalation of air at high pressures can also result in accumulation of nitrogen in the blood which may result in decompression sickness.

TOXICOLOGICAL PROPERTIES
Exposure to high pressures of air where the partial pressure of oxygen is in excess of two atmospheres may produce a variety of central nervous system manifestations including tingling of fingers and toes, visual and acoustical disturbances, abnormal sensations, impaired coordination, confusion, muscle twitching, and epileptiform seizures. Severe hazards may be present when confusion and impaired judgment lead to operational errors. Exposure to high pressures may also result in nitrogen narcosis.

RECOMMENDED FIRST AID TREATMENT
Facilities at which air is breathed under pressure should be prepared to deal with illness related to a hyperbaric environment. Decompression equipment may be required.

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	AUTO IGNITION TEMP	FLAMMABLE LIMITS	LEL	UEL
N/A	N/A	N/A	N/A	N/A

EXTINGUISHING MEDIA	ELECTRICAL CLASSIFICATION GROUP
N/A	N/A

SPECIAL FIRE FIGHTING PROCEDURES
N/A

UNUSUAL FIRE AND EXPLOSION HAZARDS
Compressed air at high pressure can accelerate the burning of materials which are combustible at atmospheric pressure.

PHYSICAL DATA

BOILING POINT (°F)	FREEZING POINT (°F)
@ 1 atm -317.9F (-194.4C)	Range: -351F to -358F (-213C to -216C) (Because air is a mixture)
VAPOR PRESSURE (psia)	**SOLUBILITY IN WATER**
N/A	@ 68F (20C), 1 atm. 1.87% by volume

VAPOR DENSITY (lb/cu ft)	SPECIFIC GRAVITY (AIR = 1)	LIQUID DENSITY (lb/cu ft)	SPECIFIC GRAVITY (H_2O = 1)
@ 68F (20C) 0.07520	@ 68F (20C), 1 atm 1.00	@ boiling point, 1 atm 54.56	@ boiling point, 1 atm 0.874

APPEARANCE AND ODOR
Gaseous air is odorless and colorless.

DISCLAIMER

Information contained in this data sheet is offered without charge for use by technically qualified personnel at their discretion and risk. All statements, technical information and recommendations contained herein are based on tests and data which we believe to be reliable, but the accuracy or completeness thereof is not guaranteed and no warranty of any kind is made with respect thereto. This information is not intended as a license to operate under or a recommendation to practice or infringe any patent of this Company or others covering any process, composition of matter or use.
Since the Company shall have no control of the use of the product described herein, the Company assumes no liability for loss or damage incurred from the proper or improper use of such product.

Printed in U.S.A., 310-816

REACTIVITY DATA

ABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	Avoid the use of oil in systems at full cylinder pressure.

COMPATIBILITY (Materials to avoid)
one

ZARDOUS DECOMPOSITION PRODUCTS
one

ZARDOUS LYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
–	WILL NOT OCCUR	X	None

SPILL OR LEAK PROCEDURES

EPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
o hazard

STE DISPOSAL METHOD
ot attempt to dispose of residual air in compressed gas cylinders. Return to Air Products with the cylinder valve tightly osed, positive pressure in the cylinder, and valve cap in place.

SPECIAL PROTECTION INFORMATION

SPIRATORY PROTECTION (Specify type)
one

NTILATION	LOCAL EXHAUST	SPECIAL
one	MECHANICAL (General)	OTHER

OTECTIVE GLOVES
eather work gloves are recommended when handling compressed gas cylinders.

ROTECTION
y asses are recommended when handling high-pressure cylinders.

HER PROTECTIVE EQUIPMENT
arety toe shoes are recommended when handling high-pressure cylinders.

SPECIAL PRECAUTIONS*

ABELING INFORMATION
ressed air shipment must be in accordance with Department of Transportation (DOT) regulations using DOT "NON-MMABLE GAS" label. Consult DOT regulations for details on the shipment of hazardous materials.

ECIAL HANDLING RECOMMENDATIONS
ompressed gas cylinders contain gas with extremely high pressure and should be handled with care. Use a pressure-ducing regulator when connecting to lower pressure piping systems. Secure cylinders when in use. Never use direct flame to at a compressed gas cylinder. Use a check valve to prevent backflow into storage container. Avoid dragging, rolling, or ding cylinders, even for a short distance. Use a suitable hand truck. For additional handling recommendations on compress-l gas cylinders, consult Compressed Gas Association Pamphlet P-1.

ECIAL STORAGE RECOMMENDATIONS
ep cylinders away from sources of heat. Storage should not be in heavy traffic areas to prevent accidental knocking over or mage from passing or falling objects. Valve caps should remain on cylinders not connected for use. Segregate full and pty cylinders. Storage areas should be free of combustible material. Avoid exposure to areas where salt or corrosive micals are present. Consult Compressed Gas Association Pamphlet P-1 for additional storage recommendations.

CIAL PACKAGING RECOMMENDATIONS
mpr ed air cylinders meet DOT specifications.

ER RECOMMENDATIONS OR PRECAUTIONS
ompressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipment of a com-essed gas cylinder filled without the permission of the owner is a violation of Federal Law.

arious Government agencies (i.e., Department of Transportation, Occupational Safety and Health Administration, Food and ug Administration and others) may have specific regulations concerning the transportation handling, storage or use of this duct which will not be reflected in this data sheet. The customer should review these regulations to ensure that he is in full mpliance.

MATERIAL SAFETY DATA SHEET

(Essentially Similar to Form OSHA-20)

MSA P/N 34337

Engineers
Planners
Economists
Scientists

SECTION I

PRODUCT	MSA CLEANER-SANITIZER II		
MANUFACTURER	Mine Safety Appliances Company 600 Penn Center Boulevard Pittsburgh, PA 15235	FORMULA CODE	8599-03
		COMPLETED BY	L. P. Dewosky
		TITLE	Mgr. Product Safety
EMERGENCY PHONE NO.	412-273-5500	DATE	6/9/83

SECTION II - INGREDIENTS

	CAS NUMBER	WEIGHT, %
ACTIVE INGREDIENTS:		54.7
SODIUM CARBONATE	497-19-8	42.2
TRISODIUM PHOSPHATE	7601-54-9	10.0
ALKYL (C14, 50%; C12, 40%; C16, 10%) DIMETHYL BENZYL AMMONIUM CHLORIDES	139-08-2	2.5
INERT INGREDIENTS:		45.3
SODIUM TRIPOLYPHOSPHATE	7758-29-4	
SODIUM BICARBONATE	144-55-8	
WATER	7732-18-5	
ISOMERIC LINEAR ALCOHOLS (C11-C15) POLYETHOXY ETHANOLS	68131-40-8*	
ETHANOL	64-17-5	
ISOBORNYL ACETATE	125-12-2	

SECTION III - PHYSICAL DATA

BOILING POINT (° F.)	NA	SPECIFIC GRAVITY (H_2O=1)	0.8
VAPOR PRESSURE (mm Hg.)	NA	%VOLATILE BY VOLUME	NA
VAPOR DENSITY (AIR=1)	NA	EVAPORATION RATE (_____=1)	NA
SOLUBILITY IN WATER	20%	pH 1% AQUEOUS SOLUTION	9.5 - 10.5
APPEARANCE AND ODOR	FRAGRANT BLEND OF WHITE POWDERS		

SECTION IV - FIRE AND EXPLOSION DATA

FLASH POINT (Method used)	NO FLASH TO 240 F	FLAMMABLE LIMITS	Lel NA	Uel NA	
EXTINGUISHING MEDIA	WATER SPRAY (FOG), FOAM, DRY CHEMICAL, CARBON DIOXIDE				
SPECIAL FIRE FIGHTING PROCEDURES	BLANKET FIRE WITH [illegible] MEDIUM				
UNUSUAL FIRE AND EXPLOSION HAZARDS	PRODUCT IS NONREACTIVE AND DOES NOT READILY SUPPORT COMBUSTION				

SKIN CONTACT WITH POWDER MAY CAUSE BURNS. FLUSH AFFECTED AREA WITH CLEAN WATER.
EYE CONTACT WITH POWDER MAY CAUSE CORNEAL BURNS. AVOID RUBBING EYES BECAUSE INSOLUBLE PARTICLES MAY SCRATCH CORNEA. IMMEDIATELY FLUSH WITH CLEAN WATER WHILE HOLDING EYELIDS APART. CONTINUE FLUSHING FOR AT LEAST 15 MINUTES OR UNTIL IRRITATION SUBSIDES. CONSULT PHYSICIAN AS SOON AS POSSIBLE.
INHALATION OF A LARGE ENOUGH QUANTITY TO POSE A SIGNIFICANT HEALTH HAZARD IS IMPROBABLE.
INGESTION OF POWDER IS HARMFUL OR FATAL. SHOULD INGESTION OCCUR, DRINK MILK, RAW EGG WHITE, OR GELATIN SOLUTION, OR LARGE QUANTITIES OF WATER. AVOID ALCOHOL. CONSULT PHYSICIAN AS SOON AS POSSIBLE.

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID	NONE
	STABLE	X		
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID	NONE
	WILL NOT OCCUR	X		
HAZARDOUS DECOMPOSITION PRODUCTS	UNDETERMINED			
INCOMPATIBILITY (MATERIALS TO AVOID)	OXIDIZING AGENTS SOAP AND ANIONIC SURFACTANTS DEACTIVATE GERMICIDE			

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED	SWEEP UP
WASTE DISPOSAL METHOD	REMOVE TO SANITARY LANDFILL AWAY FROM WATER SUPPLIES DESTROY EMPTY CONTAINERS

SECTION VIII - SPECIAL PROTECTION INFORMATION

SPECIAL RESPIRATORY PROTECTION	NOT REQUIRED
SPECIAL SKIN PROTECTION	NOT REQUIRED
SPECIAL EYE PROTECTION	NOT REQUIRED

SECTION IX - SPECIAL PRECAUTIONS

SPECIAL HANDLING PRECAUTIONS	NOT REQUIRED
SPECIAL STORAGE PRECAUTIONS	NOT REQUIRED.
OTHER SPECIAL PRECAUTIONS	NOT REQUIRED

CH2M HILL INC. Milwaukee Office 310 West Wisconsin Avenue, Suite 700 P.O. Box 2090, Milwaukee, Wisconsin 53201 414.272.2426

METHANOL
METHANOL
METHANOL

MATERIAL SAFETY DATA SHEET

FISHER SCIENTIFIC
CHEMICAL DIVISION
1 REAGENT LANE
FAIR LAWN NJ 07410
(201) 796-7100

EMERGENCY CONTACTS
GASTON L. PILLORI
(201) 796-7100

DATE: 03/01/86
PO NBR: N/A
ACCT: 111597-01
INDEX: 03-8605-80215
CAT NO: A41220

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SUBSTANCE IDENTIFICATION

CAS-NUMBER 67-56-1

SUBSTANCE: **METHANOL**

TRADE NAMES/SYNONYMS: METHYL ALCOHOL; WOOD ALCOHOL; METHYL HYDROXIDE; CARBINOL; MONOHYDROXYMETHANE; WOOD SPIRIT; WOOD NAPHTHA; U154; UN 1230;

CHEMICAL FAMILY:
HYDROXYL, ALIPHATIC

MOLECULAR FORMULA: C-H4-O MOL WT: 32.04

CERCLA RATINGS (SCALE 0-3): HEALTH=1 FIRE=3 REACTIVITY=0 PERSISTENCE=0
NFPA RATINGS (SCALE 0-4): HEALTH=1 FIRE=3 REACTIVITY=0

COMPONENTS AND CONTAMINANTS

PERCENT: 100 COMPONENT: METHYL ALCOHOL

OTHER CONTAMINANTS: NONE

EXPOSURE LIMITS:
200 PPM OSHA TWA
200 PPM NIOSH RECOMMENDED TWA
200 PPM ACGIH TWA (SKIN); 250 PPM ACGIH STEL

PHYSICAL DATA

DESCRIPTION: CLEAR, COLORLESS LIQUID; CHARACTERISTIC ALCOHOL ODOR.

BOILING POINT: 147 F (64 C) MELTING POINT: -144 F (-98 C)

SPECIFIC GRAVITY: 0.8 VAPOR PRESSURE: 97 MMHG @ 20 C

EVAPORATION RATE: (ETHER=1) 5.9 (TTE) SOLUBILITY IN WATER: SOLUBLE

SOLVENT SOLUBILITY: ETHER, BENZENE, ALCOHOL, KETONES, ORG SOLVENTS

ODOR THRESHOLD: 100 PPM   VAPOR DENSITY: 1.1

FIRE AND EXPLOSION DATA

FIRE AND EXPLOSION HAZARD:
DANGEROUS FIRE/NEGLIGIBLE EXPLOSION HAZARD WHEN EXPOSED TO HEAT OR FLAME.
FIRE AND EXPLOSION HAZARD BY REACTION WITH STRONG OXIDIZERS.
VAPORS ARE HEAVIER THAN AIR AND MAY TRAVEL A CONSIDERABLE DISTANCE TO A SOURCE OF IGNITION AND FLASH BACK.
VAPOR-AIR MIXTURES ARE EXPLOSIVE.

FLASH POINT: 52 F (11 C) (CC)   UPPER EXPLOSION LIMIT: 36.5%

LOWER EXPLOSION LIMIT: 6.0%   AUTOIGNITION TEMP.: 725 F (385 C)

FLAMMABILITY CLASS(OSHA): IB

FIREFIGHTING MEDIA:
DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY OR FOAM
(1984 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.3).

FOR LARGER FIRES, USE WATER SPRAY OR FOAM: FOAM IS PREFERRABLE.

FIREFIGHTING:
FLAMMABLE LIQUID (POISONOUS)- WEAR RESPIRATORY EQUIPMENT. DO NOT ATTEMPT TO EXTINGUISH FIRE UNLESS SPILL FLOW CAN BE STOPPED. USE FLOODING QUANTITIES OF WATER AS A FOG AND TO COOL ALL CONTAINERS INVOLVED IN FIRE. APPLY WATER FROM AS FAR A DISTANCE AS POSSIBLE. APPLICATION OF SOLID STREAMS OF WATER MAY SPREAD FIRE.

TOXICITY

5 PPM EYE-HUMAN IRRITATION; 500 MG/24 HOURS SKIN-RABBIT MODERATE IRRITATION; 40 MG EYE-RABBIT MODERATE IRRITATION; 340 MG/KG ORAL-HUMAN LDLO; 868 MG/KG UNKNOWN-HUMAN LDLO; 5628 MG/KG ORAL-RAT LD50; 64,000 PPM/4 HOURS INHALATION-RAT LC50; 1000 PPM INHALATION-MONKEY LCLO; 500 MG/KG SKIN-MONKEY LDLO; 20 GM/KG SKIN-RABBIT LD50; 8600 MG/M3 INHALATION-HUMAN TCLO; MUTAGENIC DATA (RTECS); REPRODUCTIVE EFFECTS DATA (RTECS); CARCINOGEN STATUS: NONE.

METHYL ALCOHOL IS A EYE, SKIN, AND MUCOUS MEMBRANE IRRITANT AND A CENTRAL NERVOUS SYSTEM DEPRESSANT.

HEALTH EFFECTS AND FIRST AID

INHALATION:
NARCOTIC. 25,000 PPM IMMEDIATELY DANGEROUS TO LIFE OR HEALTH.

ACUTE EXPOSURE- INTOXICATION BEGINS WITH A STATE OF INEBRIATION. WITHIN 12-18 HOURS, HEADACHE, ANOREXIA, WEAKNESS, FATIGUE, LEG CRAMPS, VERTIGO AND RESTLESSNESS OCCUR, FOLLOWED BY NAUSEA, VOMITING, DIARRHEA, DIZZINESS, AND OTHER SIGNS OF NARCOSIS, THEN SEVERE ABDOMINAL, BACK AND LEG PAIN, MUSCULAR INCOORDINATION, SWEATING, TRACHEITIS AND BRONCHITIS. APATHY OR DELIRIUM MAY PROGRESS TO COMA. EXCITEMENT, MANIA AND CONVULSIONS OCCUR

RARELY. BLURRED OR DIMMED VISION HAS OCCURRED WITH OPTIC NEURITIS, EYE PAIN AND ATROPHY, CONCENTRIC VISUAL FIELDS AND PHOTOPHOBIA, FOLLOWED BY TRANSIENT OR PERMANENT BLINDNESS. ACIDOSIS MAY RESULT IN RAPID, SHALLOW RESPIRATION, CYANOSIS, COMA AND HYPOTENSTION. MILD TACHYCARDIA, CARDIAC DEPRESSION AND PERIPHERAL NEURITIS ARE POSSIBLE AS WELL AS LIVER AND KIDNEY DAMAGE AND CEREBRAL FAILURE OR CIRCULATORY COLLAPSE. PROLONGED ASTHENIA AND PARTIAL OR COMPLETE LOSS OF VISION IN 2-6 DAYS, AND PERMANENT RENAL DYSFUNCTION MAY FOLLOW NON-FATAL INTOXICATION. BLINDNESS IS CAUSED AT 600 TO 1000 PPM. 50,000 PPM WILL PROBABLY CAUSE DEATH IN 1 TO 2 HOURS.

CHRONIC EXPOSURE- PROLONGED OR REPEATED EXPOSURE MAY CAUSE SYMPTOMS SUCH AS BLURRED VISION, CONTRACTION OF VISUAL FIELDS AND SOMETIMES, COMPLETE BLINDNESS. SEE MUTAGENIC DATA AND ANIMAL REPRODUCTIVE EFFECTS DATA REFERENCES IN TOXICITY SECTION.

FIRST AID- REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. IF BREATHING HAS STOPPED, PERFORM ARTIFICIAL RESPIRATION. KEEP AFFECTED PERSON WARM AND AT REST. GET MEDICAL ATTENTION.

SKIN CONTACT:
IRRITANT/NARCOTIC.
ACUTE EXPOSURE- CONTACT WITH LIQUID CAN PRODUCE DEFATTING AND A MILD DERMATITIS. READILY ABSORBED THROUGH INTACT SKIN TO CAUSE NARCOSIS, OPTIC NEURITIS AND ACIDOSIS.

CHRONIC EXPOSURE- PROLONGED OR REPEATED SKIN CONTACT PRODUCES ECZEMA, REDNESS AND SCALING. CHRONIC ABSORPTION MAY RESULT IN VISUAL IMPAIRMENT AND OPTIC NEURITIS. SEE MUTAGENIC DATA AND ANIMAL REPRODUCTIVE EFFECTS DATA REFERENCES IN TOXICITY SECTION.

FIRST AID- REMOVE CONTAMINATED CLOTHING AND SHOES IMMEDIATELY. WASH AFFECTED AREA WITH SOAP OR MILD DETERGENT AND LARGE AMOUNTS OF WATER UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

EYE CONTACT:
IRRITANT.
ACUTE EXPOSURE- EYE CONTACT WITH METHANOL HAS CAUSED SUPERFICIAL CORNEAL LESIONS. INGESTION, INHALATION OR SKIN ABSORPTION MAY RESULT IN BLURRED OR DIMMED VISION FOLLOWED BY TRANSIENT OR PERMANENT BLINDNESS, WITH OPTIC NEURITIS, EYE PAIN, ATROPHY, CONCENTRIC VISUAL FIELDS AND PHOTOPHOBIA. 5 PPM AND 40 MG CAUSE MODERATE IRRITATION IN EYES OF HUMANS AND RABBITS RESPECTIVELY.

CHRONIC EXPOSURE- REPEATED OR PROLONGED CONTACT MAY CAUSE CONJUNCTIVITIS. VISUAL IMPAIRMENT AS DESCRIBED ABOVE MAY INDICATE CHRONIC EXPOSURE BY INGESTION, INHALATION OR SKIN ABSORPTION.

FIRST AID- WASH EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER, OCCASIONALLY LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

INGESTION:
NARCOTIC.
ACUTE EXPOSURE- MAY CAUSE DELAYED SYMPTOMS OF HEADACHE, ANOREXIA, WEAKNESS, FATIGUE, LEG CRAMPS, VERTIGO AND RESTLESSNESS, FOLLOWED BY NAUSEA, VOMITING, DIARRHEA, DIZZINESS, AND OTHER SIGNS OF NARCOSIS. SEVERE ABDOMINAL,

BACK AND LEG PAIN, MUSCULAR INCOORDINATION, SWEATING, TRACHEITIS AND BRONCHITIS MAY OCCUR. APATHY OR DELIRIUM MAY PROGRESS TO COMA. EXCITEMENT, MANIA AND CONVULSIONS HAVE OCCURRED RARELY. BLURRED OR DIMMED VISION FOLLOWED BY TRANSIENT OR PERMANENT BLINDNESS WITH OPTIC NEURITIS, EYE PAIN, ATROPHY, CONCENTRIC VISUAL FIELDS AND PHOTOPHOBIA MAY OCCUR. ACIDOSIS MAY RESULT IN RAPID, SHALLOW RESPIRATION, CYANOSIS, COMA AND HYPOTENSION. MILD TACHYCARDIA, CARDIAC DEPRESSION AND PERIPHERAL NEURITIS ARE POSSIBLE, AS WELL AS LIVER AND KIDNEY DAMAGE AND CEREBRAL AND PULMONARY EDEMA. DEATH IS POSSIBLE FROM RESPIRATORY FAILURE OR CIRCULATORY COLLAPSE. PROLONGED ASTHENIA AND PARTIAL OR COMPLETE LOSS OF VISION IN 2-6 DAYS, AND PERMANENT RENAL DYSFUNCTION MAY FOLLOW NON-FATAL INTOXICATION.

FIRST AID- GET MEDICAL ATTENTION IMMEDIATELY. IF MEDICAL ATTENTION IS NOT IMMEDIATELY AVAILABLE, AND IF VICTIM IS CONSCIOUS, ATTEMPT TO INDUCE VOMITING BY TOUCHING FINGER TO BACK OF THROAT. ALSO GIVE SODIUM BICARBONATE (BAKING SODA), 2 TEASPOONFULS IN WATER.

REACTIVITY

REACTIVITY:
STABLE AT ORDINARY PRESSURES UP THE BOILING POINT, 64 C.

INCOMPATIBILITIES:
OXIDIZERS AND OTHER MATERIALS, EXAMPLES FOLLOW:

METHANOL:
CHLOROFORM AND SODIUM HYDROXIDE: EXPLOSIVE REACTION.
CALCIUM CARBIDE: VIOLENT REACTION.
MAGNESIUM: VIOLENT REACTION.
CYANURIC CHLORIDE: VIOLENT REACTION.
BERYLLIUM HYDRIDE: INTENSE REACTION AT 200 C.
BROMINE: INTENSE EXOTHERMIC REACTION.
CHROMIC ANHYDRIDE: POSSIBLE EXPLOSIVE REACTION.
NICKEL: POSSIBLE IGNITION IN THE PRESENCE OF CATALYTIC AMOUNTS.

DECOMPOSITION:
COMBUSTION PRODUCTS INCLUDE TOXIC/HAZARDOUS GASES OF FORMALDEHYDE, CARBON MONOXIDE AND CARBON DIOXIDE.

POLYMERIZATION:
WILL NOT OCCUR.

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CONDITIONS TO AVOID

MAY BE IGNITED BY HEAT, SPARKS OR FLAMES. CONTAINER MAY EXPLODE IN HEAT OF FIRE. VAPOR EXPLOSION AND POISON HAZARD INDOORS, OUTDOORS OR IN SEWERS. RUN-OFF TO SEWER MAY CREATE FIRE OR EXPLOSION HAZARD.

AVOID CONTACT WITH OR STORAGE WITH INCOMPATIBLE MATERIALS, INCLUDING THOSE LISTED IN THE REACTIVITY SECTION.

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SPILL AND LEAK PROCEDURES

OCCUPATIONAL SPILL:
SHUT OFF IGNITION SOURCES. PROVIDE VENTILATION. WEAR RESPIRATORY PROTECTION. DO NOT TOUCH SPILLED MATERIAL. STOP LEAK IF YOU CAN DO IT WITHOUT RISK. USE WATER SPRAY TO REDUCE VAPORS. FOR SMALL SPILLS, TAKE UP WITH SAND OR OTHER NON-COMBUSTIBLE, ABSORBENT MATERIAL AND PLACE INTO CONTAINERS FOR LATER DISPOSAL. CLOSE TIGHTLY AND LABEL 'FLAMMABLE'. FOR LARGER SPILLS, DIKE AS CLOSE TO SPILL AS PRACTICAL TO MINIMIZE ENVIRONMENTAL CONTAMINATION. NO SMOKING, FLAMES OR FLARES IN HAZARD ARES. KEEP OUT OF SEWERS AND WATER SOURCES.

WHEN MATERIAL IS INVOLVED IN FIRE:
DO NOT ATTEMPT TO EXTINGUISH FIRE UNLESS SPILL OR LEAK FLOW CAN BE STOPPED.
USE FLOODING QUANTITIES OF WATER AS A FOG.
APPLICATION OF SOLID STREAMS OF WATER MAY SPREAD FIRE.
USE FLOODING QUANTITIES OF WATER TO COOL ALL CONTAINERS INVOLVED IN FIRE.
APPLY WATER TO MATERIAL FROM AS FAR A DISTANCE AS POSSIBLE.
EXTINGUISH WITH DRY CHEMICAL, ALCOHOL FOAM OR CARBON DIOXIDE.
DO NOT ALLOW RUN-OFF WATER TO CONTAMINATE SEWERS OR WATER SOURCES.

WHEN MATERIAL NOT INVOLVED IN FIRE:
KEEP OPEN FLAMES, SPARKS OR OTHR IGNITION SOURCES AWAY.
DO NOT ALLOW MATERIAL TO CONTAMINATE SEWERS OR WATER SOURCES.
BUILD DIKES FOR CONTAINMENT OF SPILL FLOW.
STOP LEAK IF YOU CAN DO IT WITHOUT RISK.
KNOCK DOWN VAPORS WITH WATER SPRAY.

PROTECTIVE EQUIPMENT

VENTILATION:
PROVIDE LOCAL EXHAUST VENTILATION OR GENERAL DILUTION VENTILATION TO MEET PERMISSIBLE EXPOSURE LIMITS. VENTILATION EQUIPMENT MUST BE EXPLOSION-PROOF.

RESPIRATOR:
2000 PPM- SUPPLIED-AIR RESPIRATOR.
SELF-CONTAINED BREATHING APPARATUS.

10,000 PPM- SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE, HELMET, OR HOOD.
SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE.

> 10,000 PPM, INCLUDING THE IDLH LEVEL, 25,000 PPM (2.5%)-
TYPE C SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE, HELMET, OR HOOD OPERATED IN POSITIVE PRESSURE MODE OR IN CONTINUOUS-FLOW MODE.

FIREFIGHTING- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE.

CLOTHING:
EMPLOYEE MUST WEAR IMPERVIOUS CLOTHING AS NECESSARY TO AVOID ANY POSSIBILITY OF CONTACT WITH SOLUTIONS OR MISTS.

GLOVES:
WEAR PROTECTIVE GLOVES AS NECESSARY TO AVOID REPEATED OR PROLONGED CONTACT

WITH SOLUTION OR MIST. PREFERRED MATERIALS: BUTYL, NEOPRENE AND NITRILE RUBBER GLOVES.

EYE PROTECTION:
WEAR FACESHIELD (8 INCH MINIMUM) OR SPLASH-PROOF SAFETY GOGGLES WHERE THERE IS REASONABLE PROBABILITY OF CONTACT WITH LIQUID OR MIST. DO NOT WEAR CONTACT LENSES WHEN WORKING WITH CHEMICALS.

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-ADDITIONAL INFORMATION-

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